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Catalytic aquathermolysis process for upgrading of heavy crude oil

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Abstract

© SGEM2018. Recently, hydrothermal catalytic process in reservoir conditions (in-situ upgrading) has got remarkable attentions. In this study, the feasibility of the in-situ upgrading of Ashal'cha crude oil (Tatarstan region, Russia) using steam and catalyst co-injection was investigated at the temperature of 350 °C under high pressure for 24h using a stainless-steel 500-ml batch reactor. The changes in the density/API gravity, viscosity, chemical composition (SARA fractions, the composition of saturates), and elemental composition were analyzed before and after thermal treatment. In general, we can conclude that the content of resin and asphaltenes is decreased and the average molecular weight of heavy oil is reduced after hydrothermal catalytic process. The content of saturated and aromatic hydrocarbons is increased due to the destruction of the heavy components with high molecular weight, like resins and asphaltenes. Viscosity and API gravity of the heavy oil were also decreased after the thermal treatment.

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Keywords

Aquathermolysis, Catalyst, Heavy crude oil, In-situ oil upgrading

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